STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, *Governor*

DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS
4800 STOCKDALE HWY., SUITE # 417
BAKERSFIELD, CALIFORNIA 93309
(805) 322-4031

December 19, 1991

Mr. Mark Ripperda
U. S. Environmental Protection Agency
W-6-2
75 Hawthorne Street
San Francisco, CA 94105

Dear Mr. Ripperda:

Attached are copies of the only Santa Margarita zone water analysis I could locate from wells within 2 miles of the Witco disposal operations. I have labeled each analysis as to the section, township, range, operator, well name and number, and depth the sample was taken from where possible. A couple of these samples could not be clearly identified as to their exact source beyond being samples from the Santa Margarita zone. The well identifications shown on the analyses should match those on the maps I sent you.

If you have any difficulty identifying the correct well, or have any more questions, please feel free to contact me at (805) 322-4031.

Yours truly,

David Mitchell
Senior Oil and Gas Engineer

DM/njk

attachments

Deep S.N.

Chevron U.S.A., Inc. P. O. Box 1392 Bakersfield, California 93388 Good Sample

GEOCHEMICAL ANALYSIS OF WATER Pro-391

DATE OF REPORT 1/28/86
DATE OF SAMPLING 12/26/85
SAMPLED BY
LABORATORY NO. • 22240
ANALYST

WELL NO. Sheridan 1, D2-4 Sec. 4 Kern River
COMPANY Sec 4 29/28 1514'
FIELD Kern River
ZONE Santa Margarita
SAMPLE SOURCE 12/20/85 29S/28E Formation Fluid

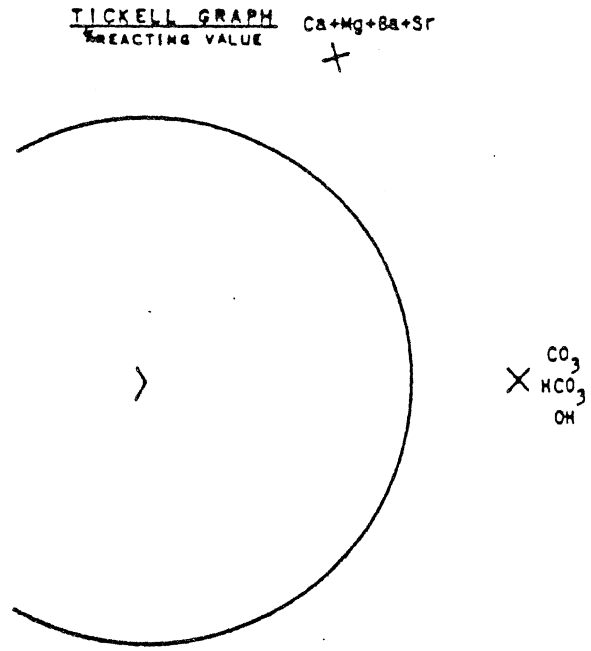
RADICALS		PARTS PER MILLION MILLIGRAMS PER LITER	REACTING VALUE EQUIVALENTS PER MILLION	REACTING VALUE PERCENT
SODIUM	Na	350.	15.22	46.24
CALCIUM	Ca	18.	0.90	2.73
MAGNESIUM	Mg	1.3	0.11	0.33
BARIUM	Ba	(-) 0.5		
STRONTIUM	Sr			
Potassium	K	9.0	0.23	0.70
Iron	Fe	0.14		
SULPHATE	SO_4	272.	5.67	17.15
CHLORIDE	Cl	222.	6.26	18.94
CARBONATE	CO_3			
BICARBONATE	HCO_3	281.	4.60	13.91
HYDROXIDE	OH			
IODIDE	I			
SILICA	SiO_2	10.		
IRON, ALUMINA	R_2O_3			
TOTAL		1,163.	33.0	100

GROUP	CHEMICAL CHARACTER		MISCELLANEOUS	
ALKALIS	PRIMARY SALINITY	72.18	BORON	1.2 PPM
EARTHS	SECONDARY SALINITY		Sulfides as HYDROGEN SULFIDE	(-) 0.1
STRONG ACIDS	PRIMARY ALKALINITY	21.70	EQUIVALENT SALT	947. PPM
WEAK ACIDS	SECONDARY ALKALINITY	6.12	RESISTIVITY @ 77°F	6.17 O.M.
Ca/ Mg=8.18			CHLORINITY	366. PPM
CHLORIDE SALINITY			SPECIFIC GRAVITY	1.000
SULPHATE SALINITY	CARBONATE/CHLORIDE	100.	pH	8.1

REMARKS

Note: The subject water contains 0.033 times the solids content of "normal sea water."

TICKELL GRAPH
% REACTING VALUE



ARC REPRESENTS "CONCENTRATION OF SOLIDS IN NORMAL SEA WATER"

SIGNED: J. J. Eglin

BC Laboratories
4100 PIERCE ROAD
BAKERSFIELD, CA 93308
(805) 327-4911

AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC LABORATORIES, INC.

4100 PIERCE ROAD, 93308 BAKERSFIELD, CALIFORNIA 93308 PHONE 327-4911

RECEIVED

JUL 31 1987

DIVISION OF OIL & GAS
BAKERSFIELD

Submitted By: Tom Ladd
c/o Dexzel Inc.
1400 Easton Drive, #152
Bakersfield, California 93309

Date Reported: 6/11/87
Date Received: 5/6/87
Laboratory No.: 8556

Marked: Ferne SWD #1 Santa Margarita Water Zone Section 6 T29S, R28E 2300'

Kern River Field

INDUSTRIAL
WATER ANALYSIS

Constituents, mg/liter	
Boron (B)	0.31
Calcium (Ca)	22
Magnesium (Mg)	2.6
Sodium (Na)	195
Potassium (K)	5.5
Carbonate (CO_3)	0.
Bicarbonate (HCO_3)	333
Chloride (Cl)	153
Sulfate (SO_4)	(-) 5
Nitrate (NO_3)	(-) 0.4
Fluoride (F)	1.0
Iron (Fe)	0.60
Manganese (Mn)	0.08
Copper (Cu)	0.01
Zinc (Zn)	0.15
Aluminum (Al)	(-) 0.5
Silica (SiO_2)	10.
Phosphate (PO_4)	(-) 0.1
Total Hardness as $CaCO_3$	65.7 (3.8 gr/gal)
Total Dissolved Solids	722.
Oil (Freon extraction)	
pH	7.9
E.C., Micromhos/cm, ($Kx10^6$) @ 25°C	950.
Resistivity, Ohm M^2/M	10.53

(-) refers to "less than".

B C LABORATORIES, INC.

BY J. J. Eglin
J. J. Eglin

AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC LABORATORIES, INC.

4100 PIERCE ROAD, 93308 BAKERSFIELD, CALIFORNIA 93308 PHONE 327-4911

Kern River Field
Santa Margarita Zone
Zone Analysis

Submitted By: Getty Oil Company
P. O. Box 5197-X
Bakersfield, California 93388
Attn: Mr. Chris Peterson

Date Reported: 12/14/84
Date Received: 11/16/84
Laboratory No.: 15520

Marked: #1 SJWD-9 FORMATION SAMPLE

Texaco
"San Joaquin" WD 4
$5^{29}/_{28}$ 029-70046
perf. 2150-2043
sample swabbed 10-19-84

INDUSTRIAL
WATER ANALYSIS

Constituents, mg/liter	
Boron (B)	2.3
Calcium (Ca)	39.
Magnesium (Mg)	4.0
Sodium (Na)	225.
Potassium (K)	12.
Carbonate (CO_3)	0.
Bicarbonate (HCO_3)	257.
Chloride (Cl)	194.
Sulfate (SO_4)	145.
Nitrate (NO_3)	(-) 0.4
Fluoride (F)	0.86
Iron (Fe)	0.77
Manganese (Mn)	2.4
Copper (Cu)	1.7
Zinc (Zn)	0.66
Aluminum (Al)	(-) 0.1
Silica (SiO_2)	58.
Phosphate (PO_4)	(-) 0.1
Total Hardness as $CaCO_3$	114. (6.6 gr/gal)
Total Dissolved Solids by summation	940.
Oil (Freon extraction)	
pH	6.5
E.C., Micromhos/cm, ($Kx10^6$) @ 25^oC	1,270.
Resistivity, Ohm M^2/M	7.87

(-) refers to "less than".

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To JOYCE	From JOHN BURNETT
Co. DOG	Co. TEXACO
Dept.	Phone # 392-2254
Fax # 861-0279	Fax #

B C LABORATORIES, INC.

BY J. J. Eglin
J. J. Eglin

AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC LABORATORIES, INC.

4100 PIERCE ROAD, 93308 BAKERSFIELD, CALIFORNIA 93308 PHONE 327-4911

Zone Analysis

Submitted By: Getty Oil Company
P. O. Box 5197-X
Bakersfield, California 93388
Attn: Mr. Chris Peterson

Date Reported: 12/14/84
Date Received: 11/16/84
Laboratory No.: 15521

Marked: #2

Kern River Field
Santa Margarita Zone
529/28 029-70046
"San Joaquin" WD 4
Perf. 2043-2150
Sample sewabled 10-19-84

INDUSTRIAL
WATER ANALYSIS

Constituents, mg/liter	
Boron (B)	1.1
Calcium (Ca)	60.
Magnesium (Mg)	2.7
Sodium (Na)	340.
Potassium (K)	14.
Carbonate (CO_3)	0.
Bicarbonate (HCO_3)	437.
Chloride (Cl)	329.
Sulfate (SO_4)	85.
Nitrate (NO_3)	(-) 0.4
Fluoride (F)	0.45
Iron (Fe)	0.25
Manganese (Mn)	1.3
Copper (Cu)	4.0
Zinc (Zn)	0.46
Aluminum (Al)	(-) 0.1
Silica (SiO_2)	38.
Phosphate (PO_4)	(-) 0.1
Total Hardness as $CaCO_3$	161. (9.4 gr/gal)
Total Dissolved Solids by summation	1,312.
Oil (Freon extraction)	
pH	6.8
E.C., Micromhos/cm, ($Kx10^6$) @ 25^oC	2,000.
Resistivity, Ohm M^2/M	5.00

(-) refers to "less than".

B C LABORATORIES, INC.

BY J. J. Eglin
J. J. Eglin

AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC LABORATORIES, INC.

4100 PIERCE ROAD, 93308 BAKERSFIELD, CALIFORNIA 93308 PHONE 327-4911

Zone Analysis

Submitted By: Getty Oil Company
P. O. Box 5197-X
Bakersfield, California 93388
Attn: Chris Peterson

Date Reported: 12/14/84
Date Received: 11/16/84
Laboratory No.: 15522

Marked: #3

Kern River Field
Santa Margarita Zone
$5^{29}/_{28}$ 029-70046
"San Joaquin" WD 4
perf. 2043-2150
Sample swabbed
10-19-84

OILFIELD
WATER ANALYSIS

Constituents, mg/liter	
Boron (B)	1.1
Calcium (Ca)	36.
Magnesium (Mg)	1.9
Sodium (Na)	355.
Potassium (K)	8.8
Carbonate (CO_3)	0.
Bicarbonate (HCO_3)	381.
Chloride (Cl)	354.
Sulfate (SO_4)	70.
Nitrate (NO_3)	(-) 0.4
Fluoride (F)	0.40
Iron (Fe)	0.63
Manganese (Mn)	0.61
Copper (Cu)	0.48
Zinc (Zn)	0.05
Aluminum (Al)	(-) 0.1
Silica (SiO_2)	34.
Phosphate (PO_4)	(-) 0.1
Total Hardness as $CaCO_3$	97.9 (5.7 gr/gal)
Total Dissolved Solids by summation	1,242.
Oil (Freon extraction)	
pH	6.9
E.C., Micromhos/cm, ($Kx10^6$) @ 25^oC	2,100.
Resistivity, Ohm M^2/M	4.76

(-) refers to "less than".

B C LABORATORIES, INC.

BY J. J. Eglin
J. J. Eglin

AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC LABORATORIES, INC.

4100 PIERCE ROAD, 93308 BAKERSFIELD, CALIFORNIA 93308 PHONE 327-4911

Kern River Field
Santa Margarita Zone
Zone Analysis

Submitted By: Getty Oil Company
P. O. Box 5197-X
Bakersfield, California 93388
Attn: Mr. Chris Peterson

Date Reported: 12/14/84
Date Received: 11/16/84
Laboratory No.: 15523

Marked: #4

Texaco
"San Joaquin" WD-4
5 29/28 029-70046
perf. 2043-2150
fm. sample swabbed
10-19-84

INDUSTRIAL
WATER ANALYSIS

Constituents, mg/liter	
Boron (B)	1.2
Calcium (Ca)	35.
Magnesium (Mg)	1.9
Sodium (Na)	344.
Potassium (K)	8.8
Carbonate (CO_3)	0.
Bicarbonate (HCO_3)	305.
Chloride (Cl)	371.
Sulfate (SO_4)	65.
Nitrate (NO_3)	(-) 0.4
Fluoride (F)	0.34
Iron (Fe)	0.21
Manganese (Mn)	0.09
Copper (Cu)	0.93
Zinc (Zn)	0.05
Aluminum (Al)	(-) 0.1
Silica (SiO_2)	36.
Phosphate (PO_4)	1.5
Total Hardness as $CaCO_3$	95.4 (5.6 gr/gal)
Total Dissolved Solids by summation	1,169.
Oil (Freon extraction)	
pH	7.3
E.C., Micromhos/cm, ($Kx10^6$) @ 25°C	1,770.
Resistivity, Ohm M^2/M	5.65

(-) refers to "less than".

B C LABORATORIES, INC.

BY J. J. Eglin
J. J. Eglin

TENNECO OIL COMPANY

April 17, 1967

C

State of California
Oil and Gas Division
318 Chester Avenue
Bakersfield, California

Gentlemen:

O

Tenneco Oil Company is proposing to drill and complete two waste water disposal wells in the Santa Margarita sand at the following approximate locations in the Kern River Field.

* J.K. Smith "A" WIW #1 — 900'S., 850'W., E/4 corner Section 25-28/27
Estimated K.B. elev. 805', drilling depth 2550', top Santa Margarita sand 2165'

* J.K. Smith "B" WIW #1 — 800'S., ~~750~~ 650'W., NE corner Section 6-29/28 *
Estimated K.B. elev. 600', drilling depth 2550', top Santa Margarita sand ~~2060'~~ 2160' *

P

Casing (5-1/2") will be set, cemented, and jet perforated. It is anticipated that approximately 1000-1500 barrels water per day will be injected into each well through 3" tubing and a packer. A comparison of the formation and injection waters is as follows:

Y

	Smith "A"		Smith "B"		Santa Margarita	
NaCl	200-300	ppm	200-300	ppm	250-500	ppm
Total Hardness	95	ppm	150	ppm	40-50	ppm
T.D.S.	475	ppm	580	ppm	600-1000	ppm
* Boron	0.33	ppm	0.38	ppm	4.0	ppm

Kern River
Arco
Santa Margarita Zone
34000035

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APR 18 1967
DIVISION OF OIL AND GAS
BAKERSFIELD, CALIFORNIA

This analysis was in well file Arco "Tenneco Fee B" WDW 1 6-29/28 - analysis may or may not be from this well

* Hluza/Gray 4-18-67

Mr. Mark Ripperda
U.S. ENVIRONMENTAL PROTECTION AGENCY
W-6-2
75 Hawthorne St.
San Francisco, CA 94105

Dear Mr. Ripperda,

Attached are copies of the only Santa Margarita zone water analyses I could locate from wells within 2 miles of the Witco disposal operations. I have labeled each analysis as to the section, township, range, operator, well name and number, and depth the sample was taken from where possible. A couple of these samples could not be clearly identified as to their exact source beyond being samples from the Santa Margarita zone. The well identifications shown on the analyses should match those on the maps I sent you. If you have any difficulty identifying the correct well, or have any more questions, please feel free to contact me at (805) 322-4031.

Yours truly,

David Mitchell
Senior Oil and Gas Engineer